

## THE GENUS *MIRANDEA* (ACANTHACEAE)

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This paper is part of a series of monographs, revisions, and synopses of predominantly Mexican Acanthaceae. The ultimate goal of the series is to provide a systematic treatment of the family for Mexico and surrounding regions. Other genera already treated are *Carlowrightia* (Daniel, 1980; Daniel, 1983a) and *Holographis* (Daniel, 1983b).

The genus *Mirandea* comprises two species of shrubs which occur in the arid regions of northeastern Mexico. The genus was described by Rzedowski in 1959 based on *M. grisea* from San Luis Potosí. Subsequently, Daniel (1979) described a second species from Nuevo León. Despite their occurrence in accessible regions close to the United States, the species of *Mirandea* were not described until relatively recently and both are poorly known in herbaria. The reasons for this appear to be twofold. First, little work has been done on the taxonomy of Mexican Acanthaceae since Standley's (1926) treatment of the woody species in *Trees and Shrubs of Mexico*. In that work, Standley apparently referred a specimen of *M. huastecensis* to *Carlowrightia parvifolia* Brandege. Secondly, although the species are capable of forming extensive populations, both are restricted in distribution. Continued botanical exploration in northeastern Mexico will undoubtedly result in the discovery of additional local species of Acanthaceae.

Using the classificatory scheme of Bremekamp (1965), *Mirandea* would be included within the tribe Justiciaeae subtribe Odontoneminae where its closest relatives appear to be *Carlowrightia* A. Gray and *Anisacanthus* Nees. In addition to a number of common vegetative and floral characters, these genera all have the same basic pollen type and chromosome number. The pollen of each genus is prolate and tricolporate with six pseudocolpi. A chromosome number of  $2n = 36$  has been reported for four species of *Carlowrightia* (Reveal and Spellenberg, 1976; Daniel, 1980) and two species of *Anisacanthus* (Grant, 1955). Herewith is reported the first count for *Mirandea* of  $n = 18$  in *M. grisea* (Daniel 331). These three genera can be distinguished by the following key:

1. Stamens appressed to the upper lip of the corolla, the filaments twisted, the anthers opening toward the lower lip; style recurved near the apex. *Mirandea*.
1. Stamens not appressed to the upper lip of the corolla, the filaments not twisted, the anthers opening toward the upper lip; style straight near the apex.
  2. Stout shrubs to 3 m high; corolla bright red or orange, 30-60 mm long. *Anisacanthus*.
  2. Suffrutescent herbs or weak shrubs, usually less than 1 m high; corolla white, cream or blue, 6-20 (-27) mm long. *Carlowrightia*.

**Mirandea** Rzedowski, Ciencia (México) 19: 80. 1959.

Erect, much-branched shrubs to 1 m tall. Older stems brown, usually fissured, pubescent or glabrate. Younger stems greenish, multi-striate, pubescent with eglandular trichomes. Leaves opposite, subsessile or petiolate, the laminae

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to 20 mm long and 7 mm wide, acropetally reduced to flower-bearing bracts. Inflorescence spicate or racemose or consisting of panicles of spikes or racemes. Flowers opposite or alternate along the inflorescence axes, sessile or short-pedicellate, subtended by 2 bractlets, the flowers and bractlets sessile or pedunculate in the axil of a bract. Calyx deeply 5-lobed, the lobes subulate, often glandular pubescent. Corolla bluish or rose-colored, bilabiate, the tube ampliate above, the upper lip erect, bifid, the lower lip 3-lobed, the lobes spreading. Stamens 2, appressed to the upper lip of the corolla, the filaments twisted just below the anthers, the anthers dorsifixed, bithecous, the thecae homomorphic, parallel, basally rounded, subequally inserted on the filament. Pollen prolate, tricolporate, each colpus flanked by pseudocolpi. Style pubescent, recurved just below the stigma. Stigma bilobed. Capsule stipitate, the head ovoid, pubescent. Seeds 2 (-4) per capsule, subcirculate, laterally flattened, obliquely notched at base, the testa granulate.

Type species: *M. grisea* Rzedowski.

Distribution: Endemic to the eastern and southern periphery of the Chihuahuan Desert Region of northeastern Mexico (Fig. 1).

#### KEY TO THE SPECIES OF *MIRANDEA*

- Leaves subsessile, 3-10 mm long, the margins flat, ciliate; inflorescence racemose, the flowers pedunculate, not opposite, usually borne on only one side of the axis; bracts narrowly ovate to narrowly elliptic, 2-4 mm long, eglandular; corolla rose-purple. *M. huastecensis*.
- Leaves petiolate, 7-20 mm long, the margins revolute, not ciliate; inflorescence spicate, the flowers sessile, opposite; bracts lanceolate to subulate, 4.5-6.0 mm long, occasionally glandular; corolla blue-purple. *M. grisea*.

***Mirandea huastecensis*** T. F. Daniel, Systematic Botany 3: 428. 1979. Type: Mexico: Nuevo León: Huasteca Canyon, 1.4 mi. S of the Centro Recreativo La Huasteca, ca. Lat. 25°38'N, Long. 100°27'W, *Daniel 252* (MICH!, holotype; ASU!, CAS!, CHAPA!, DUKE!, ENCB!, F!, GH!, INIF!, K!, MEXU!, MO!, NY!, TEX!, UC!, US!, WTU!, isotypes).

Younger stems pubescent with an overstory of stiff, erect to retrorse trichomes 0.3-0.7 (-1.0) mm long and an understory of appressed trichomes 0.05-0.10 mm long. Leaves subsessile to short-petiolate, the petioles 1.0-1.5 mm long, the mature laminae ovate to elliptic (to obovate), the younger laminae lance-ovate to narrowly elliptic, 3-10 mm long, 1.0-5.5 mm wide, 2-4 times longer than wide, cuneate at base, rounded to acute at apex, the margin flat, ciliate. Inflorescence racemose, 30-70 mm long, the axes pubescent with eglandular trichomes, canescent. Flowers pedunculate, usually borne singly along one (rarely both) side of the inflorescence axes, the peduncles 2.0-4.5 mm long. Bracts narrowly ovate to narrowly elliptic, 2-4 mm long, 0.8-1.5 mm wide, eglandular. Bractlets narrowly elliptic to subulate, 1-3 mm long, eglandular. Calyx 3.5-4.8 mm long, rarely glandular, the lobes 3.0-4.5 mm long. Corolla rose-purple within, (12-) 14-20 mm long, the lobes of the lower lip 3-4 mm long. Stamens 7-9 mm long, the thecae 2.0-2.3 mm long. Style 9-12 mm long. Capsule 8-11 mm long, the head 5-7 mm long. Seeds 3.5-4.0 mm long, 2.5-3.0 mm wide.

Flowering: June to September.

Distribution: Limestone slopes in mesquite scrub, Huasteca Canyon, west-central Nuevo León (Fig. 1).

This species is known only from Huasteca Canyon, an immense limestone canyon southwest of Monterrey, where it has been collected on several occasions. The species is a dominant element of the steep slope vegetation in parts of the canyon.

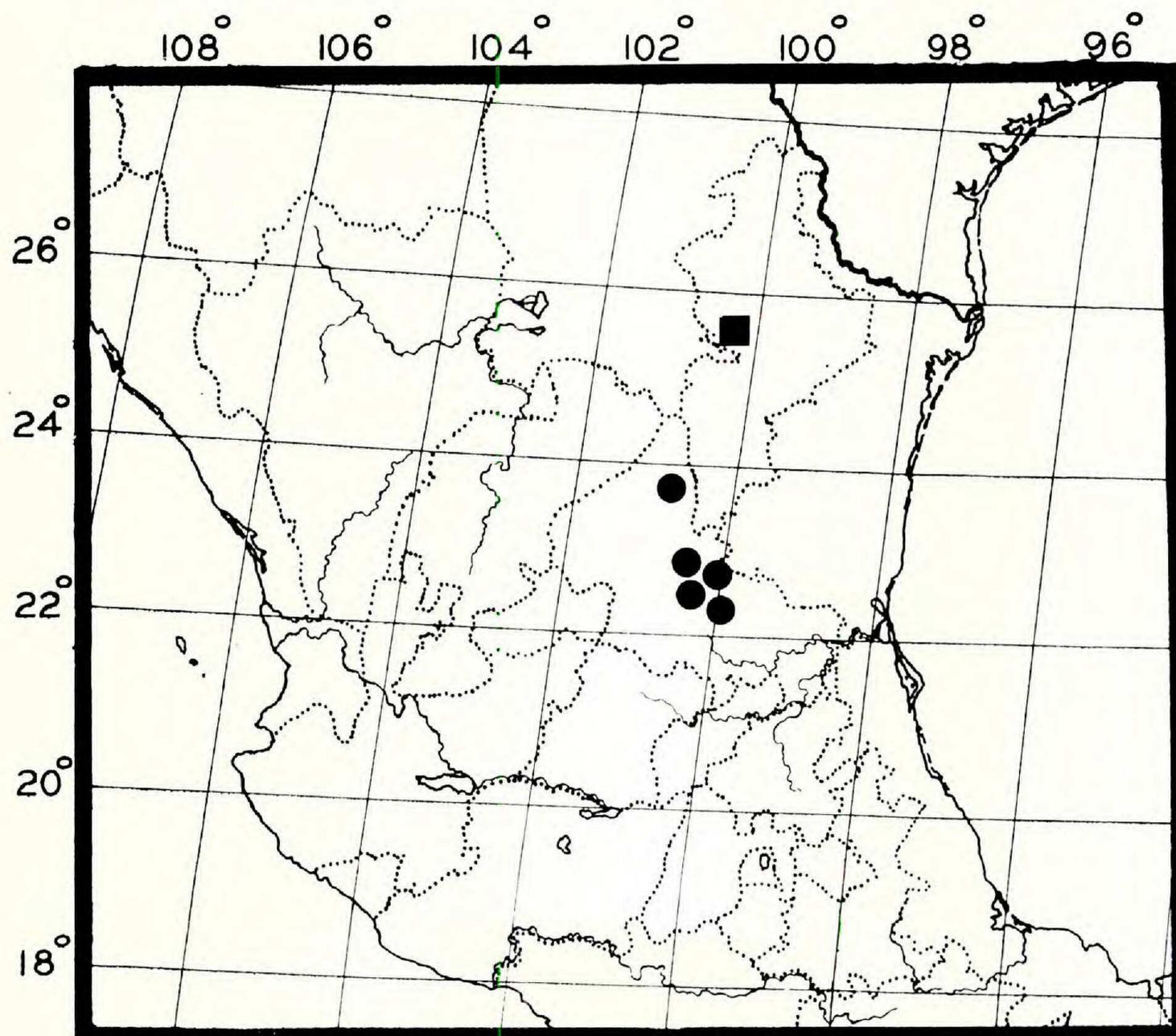


FIG. 1. Distribution of *Mirandea huastecensis* (square) and *M. grisea* (circles).

Little is known concerning the reproductive biology of this species. When plants of *M. huastecensis* were visited during the summer of 1978, fruit production was evident but most of the seeds had been destroyed by insect larvae. The flowers had no detectable fragrance but produced nectar at the base of the corolla tube. Pollination is likely effected by bees or flies which descend the tube for nectar or which feed on the pollen.

Additional specimens examined: Mexico. Nuevo León: Huasteca Canyon, 1.4 mi S of the Centro Recreativo La Huasteca, *Daniel* 762 (ARIZ, ASU, CHAPA, ENCB, INIF, MICH, MEXU); Huasteca Canyon, *Ward* 5715 (DUKE, MICH); above Ranch of Dr. E. Aguirre Pequeno, Canyon de Huastecas, *Kruckeberg* 4804 (MICH, NY, UC, WTU); Huasteca Canyon, *LeSueur* 413 (F, TEX); Monterrey & Sta. Catarina, *Arsene* 6278 (F, MO, US); Huasteca Canyon, *Langman* 2919 (US).

***Mirandea grisea*** Rzedowski, *Ciencia (México)* 19: 80. 1959. Type: Mexico. San Luis Potosí: 20 km. al NW de Cd. del Maíz, *Rzedowski* 9464 (MEXU, holotype; MICH!, isotype). Fig. 2.

Younger stems pubescent with appressed trichomes 0.05–0.30 mm long. Leaves petiolate, the petioles 1–3 mm long, the laminae lanceolate to narrowly elliptic (to oblanceolate), 7–20 mm long, 1–7 mm wide, 3–6 times longer than wide, cuneate to obtuse at base, acuminate to acute at apex, the margin revolute, not ciliate. Inflorescence spicate, 20–120 mm long, the axes occasionally glandular. Flowers sessile, opposite at the nodes of the inflorescence axes. Bracts lanceolate to subulate, 4.5–6.0 mm long, 0.8–2.0 mm wide, occasionally glandular. Bractlets subulate, 1.5–3.0 mm long, usually glandular. Calyx 3.5–4.0 mm long, glandular, the lobes 3 mm long. Corolla blue-violet, 11–19 mm long, the

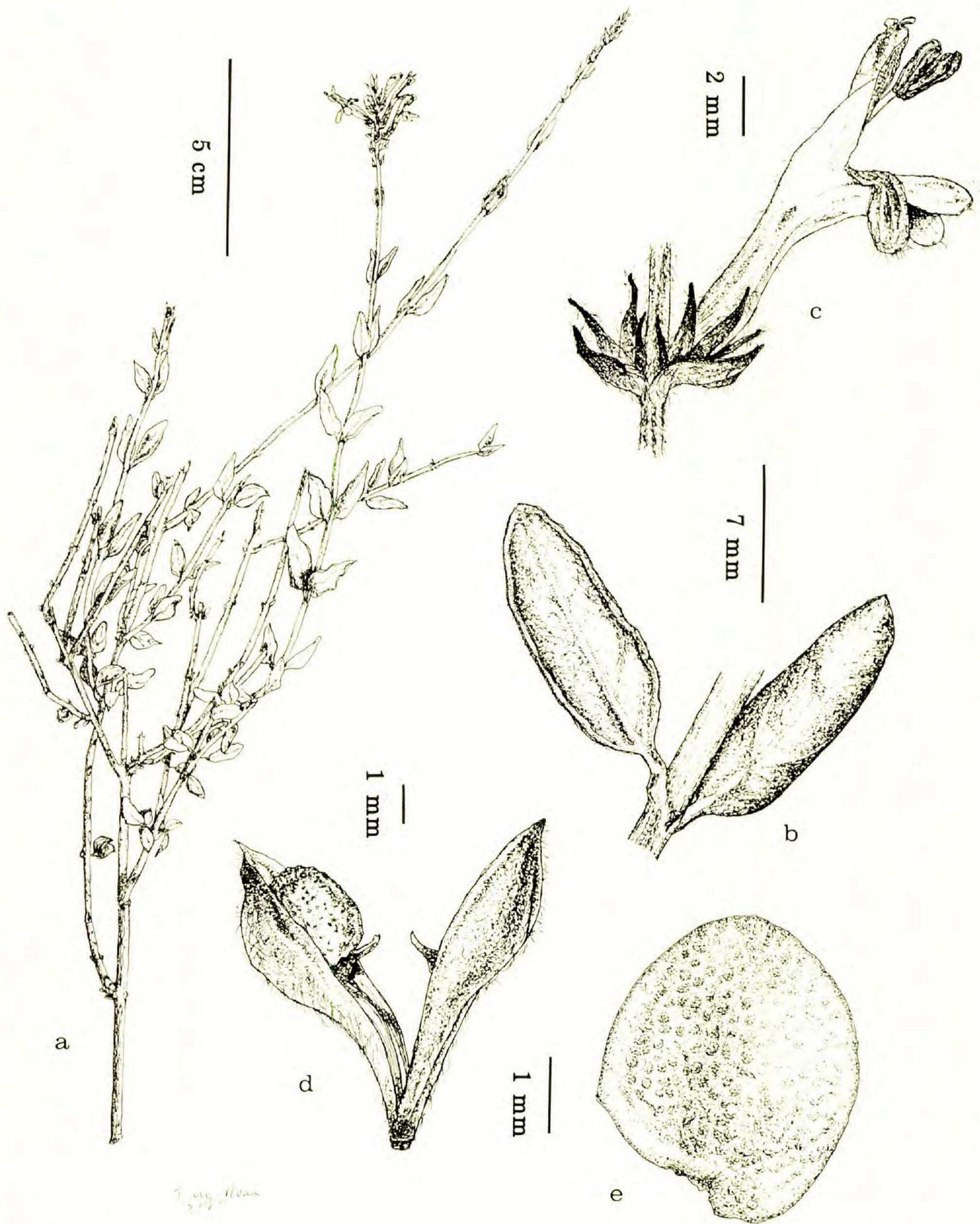


FIG. 2. *Mirandea grisea* (Daniel 331). a, habit; b, vegetative node with leaves; c, inflorescence node showing one flower; d, capsule; e, seed.

lobes of the lower lip 3.3–5.5 mm long. Stamens 6–7 mm long, the thecae 1.8–2.0 mm long. Capsule 8.5–11.0 mm long, the head 5–7 mm long. Seeds 3.5–4.0 mm long, 3.0–3.5 mm wide. ( $n = 18$ ).

Flowering June to December.

Distribution: Desert flats and rocky slopes dominated by *Prosopis*, *Larrea*, *Agave*, *Yucca*, *Opuntia*, *Jatropha*, and *Condalia* in northern and central San Luis Potosí at elevations from 1000 to 1400 meters (Fig. 1).

This species has a larger range than *M. huastecensis*, being known from an area of approximately 6000 square kilometers. Like *M. huastecensis*, *M. grisea*

becomes a dominant element of the vegetation in parts of its range, sometimes forming nearly pure stands of several hundred square meters.

Populations of *M. grisea* visited during the summer and fall of 1978 showed considerable fruit production. The only visitors observed were numerous small, black ants which roamed around the flowers. Abortion of the two anthers was observed in a large proportion of the flowers. Seeds of *Daniel 331* were subsequently grown in a greenhouse at The University of Michigan. The adult plants were partially self-compatible with only a small number of artificially selfed flowers producing fruits.

Additional specimens examined: Mexico. San Luis Potosí: 17.9 mi. E of jct. Hwy. 80 and Hwy. 57, ca. Lat. 22°47'N, Long. 100°15'W, *Daniel 331* (ASU, CAS, DUKE, ENCB, GH, MICH, NY, UC, US); 9.5 mi. SE of El Tepeyac, ca. Lat. 22°35'N, Long. 99°50'W, *Daniel 852* (ASU, F, MEXU, MICH, MO, NY, TEX); 10.6 mi. W of Cd. del Maíz, ca. Lat. 22°30'N, Long. 99°42'W, *Henrickson & Lee 17585* (ASU); eastern San Luis Potosí, *Kenoyer 2394* (GH); cerca de Matehuala, *Paray 2619* (MICH); Duro, SE of Las Tablas, *Pennell 18064* (F, MICH, NY, PH); just E of Huizache Jct., *Pinkava et al. P13537* (ASU, ENCB); 5 km. al SW de Presa de Guadalupe, mpio. de Guadalcázar, *Rzedowski 6760* (MICH); 8 km. al NNW de Santa Ana Pozas, mpio. de Guadalcázar, *Rzedowski 8250* (MICH).

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